

WHAT IS CLAIMED IS:

- Sub A1*
1. An image pickup apparatus comprising:
a plurality of unit cells arranged in an array,
each unit cell including a plurality of photoelectric
conversion portions and a common circuit for inputting
signals from said plurality of photoelectric conversion
portions and outputting the signals from said unit
cell;
- first addition means for adding the signals from
said plurality of photoelectric conversion portions in
said unit cell; and
- second addition means for adding the signals from
said plurality of photoelectric conversion portions
outside said unit cell.
2. An apparatus according to claim 1, wherein
said common circuit comprises amplification means
for amplifying the signals from said plurality of
photoelectric conversion portions and outputting the
signals.
3. An apparatus according to claim 2, wherein
said first addition means adds the signals at an
input portion of said amplification means.
4. An apparatus according to claim 1, wherein
said second addition means adds the signals using

horizontal transfer means.

5 5. An apparatus according to claim 1, wherein
said first addition means adds the signals from
said plurality of photoelectric conversion portions
arrayed in a horizontal direction, and said second
addition means adds the signals from said plurality of
photoelectric conversion portions arrayed in a vertical
or/and oblique directions.

10

6. An apparatus according to claim 1, further
comprising

15 read means for reading out signals from
photoelectric conversion portions of two lines in a
vertical direction by interlaced scanning.

Fig. 6
Fig. 7

20 7. An image pickup apparatus comprising:
a plurality of unit cells arranged in an array,
each unit cell including a plurality of photoelectric
conversion portions and a common circuit for inputting
signals from said plurality of photoelectric conversion
portions and outputting the signals from said unit
cell; and

25 addition means for adding the signals from said
plurality of photoelectric conversion portions for
outputting signals of the same color outside said unit
cell.

8. An apparatus according to claim 7, wherein
said common circuit comprises amplification means
for amplifying the signals from said plurality of
photoelectric conversion portions and outputting the
5 signals.

9. An apparatus according to claim 7, wherein
said addition means adds the signals using
horizontal transfer means.

10

10. An apparatus according to claim 7, further
comprising

read means for reading out signals from
photoelectric conversion portions of two lines in a
vertical direction by interlaced scanning.

15

11. An apparatus according to claim 7, further
comprising

a color filter arranged in said photoelectric
conversion portions.

20

12. An apparatus according to claim 1, wherein
said common circuit comprises amplification means
for amplifying the signals from said plurality of
photoelectric conversion portion in said unit cell and
reset means for resetting said photoelectric conversion
portions in said unit cell.

25

13. An apparatus according to claim 1, further comprising

image signal storage means for storing an image signal from said common circuit in said unit cell,

5 variation signal storage means for storing a variation signal in characteristics of said common circuit to correct a variation in characteristics of said common circuit, and

10 differential means for subtracting a signal from said variation signal storage means from a signal from said image signal storage means.

14. An apparatus according to claim 1, further comprising

15 first storage means for storing a first signal from said common circuit in said unit cell,

second storage means for storing a second signal from said common circuit, and

20 differential means for differentiating a signal from said second storage means from a signal from said first storage means.

15. An apparatus according to claim 14, wherein

25 said first signal is an image signal, and the second signal is a noise signal.

16. An apparatus according to claim 1, further

comprising

adjustment means for adjusting at least a pitch
between said photoelectric conversion portions to an
equal pitch in at least one of a vertical direction and
5 a horizontal direction.

17. An apparatus according to claim 16, wherein
said adjustment means comprises a light-shielding
film.

10 18. An apparatus according to claim 1, wherein
said common circuit is arranged at a central
portion of said unit cell.

15 19. An apparatus according to claim 16, wherein
said light-shielding film is arranged between unit
cells which are adjacent to each other.

20 20. An apparatus according to claim 19, wherein
said light-shielding film is arranged at a
position line-symmetric with respect to a central line
of said unit cell in at least one of a horizontal
direction and a vertical direction.

25 21. An image pickup apparatus comprising:
a plurality of unit cells arranged in an array,
each unit cell including a plurality of photoelectric

conversion portions and a common circuit for inputting signals from said plurality of photoelectric conversion portions and outputting the signals from said unit cell; and

5 addition switching means for arbitrarily switching the signals from said photoelectric conversion portions, which are to be added in said cell.

10 22. An apparatus according to claim 21, wherein said common circuit comprises amplification means for amplifying the signals from said plurality of photoelectric conversion portions and outputting the signals.

15 23. An apparatus according to claim 21, wherein said addition switching means has a switching mode for adding the signals from a horizontal array of photoelectric conversion portions.

20 24. An apparatus according to claim 21, wherein said addition switching means has a switching mode for adding the signals from a vertical array of photoelectric conversion portions.

25 25. An apparatus according to claim 21, wherein said addition switching means has a switching mode for adding all signals from said photoelectric

conversion portions connected to said common circuit.

26. An apparatus according to claim 21, further comprising

5 driving pulse switching means for horizontal scanning means and/or vertical scanning means of said image pickup apparatus.

27. An apparatus according to claim 21, wherein
10 said unit cell comprises a plurality of photoelectric conversion portions arranged in m rows and n columns ($m + n \geq 3$; m and n are natural numbers), and a common amplifier for inputting signals from said plurality of photoelectric conversion portions, and
15 wherein vertical scanning means comprises m vertical scanning means to control said photoelectric conversion portion rows in units of unit cells.

28. An apparatus according to claim 21, wherein
20 said common circuit comprises amplification means for amplifying the signals from said plurality of photoelectric conversion portion in said unit cell and reset means for resetting said photoelectric conversion portions in said unit cell.

25

29. An apparatus according to claim 21, further comprising

image signal storage means for storing an image signal from said common circuit in said unit cell,

variation signal storage means for storing a variation signal in characteristics of said common circuit to correct a variation in characteristics of said common circuit, and

differential means for subtracting a signal from said variation signal storage means from a signal from said image signal storage means.

10

30. An apparatus according to claim 21, further comprising

first storage means for storing a first signal from said common circuit in said unit cell,

15

second storage means for storing a second signal from said common circuit, and

differential means for differentiating a signal from said second storage means from a signal from said first storage means.

20

31. An apparatus according to claim 21, wherein said first signal is an image signal, and the second signal is a noise signal.

25

32. An apparatus according to claim 21, further comprising

adjustment means for adjusting at least a pitch

between said photoelectric conversion portions to an equal pitch in at least one of a vertical direction and a horizontal direction.

5 33. An apparatus according to claim 32, wherein said adjustment means comprises a light-shielding film.

10 34. An apparatus according to claim 21, wherein said common circuit is arranged at a central portion of said unit cell.

15 35. An apparatus according to claim 32, wherein said light-shielding film is arranged between unit cells which are adjacent to each other.

20 36. An apparatus according to claim 35, wherein said light-shielding film is arranged at a position line-symmetric with respect to a central line of said unit cell in at least one of a horizontal direction and a vertical direction.

25 37. An image pickup system comprising:
 a sensor unit including
 a plurality of unit cells arranged in an array,
each unit cell including a plurality of photoelectric conversion portions and a common circuit for inputting

signals from said plurality of photoelectric conversion portions and outputting the signals from said unit cell; first addition means for adding the signals from said plurality of photoelectric conversion portions in
5 said unit cell; and second addition means for adding the signals from said plurality of photoelectric conversion portions outside said unit cell; a lens for forming an image of light on a sensor unit; and

10 a signal processing circuit for processing a signal from said sensor unit.

38. An image pickup system comprising:

a sensor unit including

15 a plurality of unit cells arranged in an array, each unit cell including a plurality of photoelectric conversion portions and a common circuit for inputting signals from said plurality of photoelectric conversion portions and outputting the signals from said unit cell; and addition means for adding the signals from
20 said plurality of photoelectric conversion portions for outputting signals of the same color outside said unit cell; a lens for forming an image of light on a sensor unit; and a signal processing circuit for processing a signal from said sensor unit.

25

39. An image pickup system comprising:

a sensor unit including

a plurality of unit cells arranged in an array,
each unit cell including a plurality of photoelectric
conversion portions, and a common circuit for inputting
signals from said plurality of photoelectric conversion
5 portions and outputting the signals from said unit
cell; and addition switching means for arbitrarily
switching the signals from said photoelectric
conversion portions, which are to be added in said
cell; a lens for forming an image of light on a sensor
10 unit; and

a signal processing circuit for processing a
signal from said sensor unit.